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Filed July 14, 1992

Applicants note that in the specification and Claim 4, the phrase "sulfite waste liquor" has been replaced with "sulfite spent liquor". One skilled in the art would understand that the terms "waste" and "spent" with respect to a liquor are equivalent as evidenced by the attached excerpt of a foreign chemical dictionary, Svensk Standard SS 12 20 05 (1992). In addition, Applicants have added new claims 15 and 16, which are supported, for example, in original claims 8 and 13. Accordingly, no new matter arises; favorable consideration of the present claims is respectfully requested.

Applicants note the objection to the drawings by the draftsperson attached to the pending Office Action. Applicants advise that formal drawings will be submitted upon the allowance of the present application.

Applicants turn now to address the Examiner's substantive comments in the pending Office Action.

I. On Page 2 of the Office Action, the Examiner found the new Declaration/Power of Attorney submitted April 26, 1994 to be defective. Supplemental papers were filed in response to the Examiner's position on May 26, 1994, which should correct any deficiency in relation to this point.

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II. Applicants note that the Examiner has not acknowledged Applicants' claim to priority, nor receipt of the priority document from the PCT branch.

The above-identified application was filed on September 9, 1992, from a PCT application with an international filing date of January 10, 1991, and claims priority to Finland Application No. 900220, filed January 15, 1990.

Since the PCT branch normally forwards the priority document to the PTO U.S. prosecution file, Applicants hereby request that the Examiner acknowledge Applicants' claim to priority and receipt of the priority document.

III. On Page 2 of the Office Action, the Examiner states that the application lacks a brief description of the drawings.

A description of the figure is disclosed at page 15 of the application. Accordingly, in order to further prosecution, Applicants have inserted this discussion into a section entitled "Brief Description Of The Figure" in order to obviate this basis of objection.

IV. The Examiner notes that the taxonomic names of microorganisms need to be underlined or italicized. Applicants have italicized the taxonomic names of microorganisms in response to the Examiner's comments.

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The Examiner also notes that the spelling of "xylane" is incorrect in certain occurrences in the application.

Applicants' have reviewed the application and have not found instances of "xylane" being misspelled. Applicants request that the Examiner specifically point out such occurrences, so that appropriate corrections can take place.

V. On pages 3 to 4 of the Office Action, Claims 1-14 are rejected under 35 U.S.C. §112, second paragraph, as being indefinite.

Applicants submit that the amendments to the claims obviate the Examiner's bases of rejection.

VI. On Page 5 of the Office Action, Claims 1-14 are rejected under 35 U.S.C. §102(b) as being anticipated by Hekkila, et al (published July 26, 1990).

The present application is a PCT application with an international filing date of January 10, 1991. 35 U.S.C. §363 states that an international application designating the United States shall have the effect from its international filing date under article 11 of this treaty of a national application for patent regularly filed in the PTO with the exception of under 35 U.S.C. §102(e).

Thus the critical date for determining what is prior art under 102(b) to the present invention is more than one year

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prior to January 10, 1991, i.e., before January 10, 1990. Since the cited Hekkila et al reference was published July 26, 1990, it cannot be 35 U.S.C § 102(b) prior art to the present claims. Moreover, Applicants note that that the present application can claim priority back to January 15, 1990, and thus could antedate the cited reference upon the submission of a certified translation of the priority document.

Accordingly, the rejection of the present claims over the above-cited reference should be withdrawn.

VIII. Pages 5 to 6 of the Office Action, Claims 1-14 are rejected under 35 U.S.C. §103 as being obvious over Jeffries or Lohmeir-Vogel et al in view of Jaffe and Onishi.

Applicants respectfully traverse for the following reasons.

The present invention provides yeast fermentation for the simultaneous production of ethanol and xylitol in high yields. The Examiner's position is that the two primary references at least suggest the presently claimed method.

Claim 1 of the present invention requires fermenting said hydrolyzed lignocellulose-containing material with a yeast strain which is capable of (i) converting free xylose to xylitol and (ii) free hexoses present to ethanol.

The Jeffries' abstract discloses that xylose obtained from xylane can be converted to ethanol by *Candida shehatae*,

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whereby xylitol is formed as a valuable by-product. In contrast, in the presently claimed process, xylitol is directly formed from xylose, and ethanol is formed from hexoses.

Lohmeir-Vogel discloses an attempt to obtain more ethanol and less xylitol during pentose fermentation by changing the reaction conditions i.e. by adding azide or by lowering the water activity. In contrast, as stated above, the presently claimed process provides xylitol directly formed from xylose, and ethanol is formed from hexoses.

Jaffe uses a hexose-fermenting yeast which is inert to pentoses, to product xylitol. In addition, the Jaffe process includes a hydrogenating step. Onishi teaches xylitol production by using D-xylulose as the main carbon source or by using glucose as the main carbon source, whereby acetic acid bacteria are used in addition to yeast. Neither of these secondary references suggest the presently claimed process which directly converts xylose to xylitol, and hexoses to ethanol.

The presently claimed invention uses a yeast which produces xylitol from xylose and ethanol from hexoses. Thus, complex raw materials may be employed as a starting material. This process is neither disclosed, suggested, or enabled by any of the above-cited references.

Accordingly, Applicants submit that the presently claimed process is not obvious over any of the above-cited references; therefore, Applicants respectfully request that the

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Examiner withdraw the pending obviousness rejection over the  
above-cited references.

CONCLUSION

In view of the above remarks and amendments to the  
claims, Applicants' respectfully submit that the presently  
claimed invention fully meets the requirements of 35 U.S.C.  
§ 112, and is neither anticipated by nor obvious over the cited  
references. Accordingly, all rejections should be withdrawn and  
this case should be passed to issuance.

Any inquiry concerning this submission should be  
directed to the undersigned at the telephone number listed below.

Respectfully submitted,

Dated: 9 November 1994

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SVENSK STANDARD SS 15 20 05  
1992-01-29  
Utgåva 4  
UDK 678.001.4

Oy KOLSTER Ab

## PAPPERSORDLISTA

sv-en-fr-de-da-fi-no

Utarbetad av SIS - Allmänna Standardiseringsgruppen, SIS-STG,  
i samarbete med Tekniska monteringscentralen, TNC

Stockholm 1992

- 1036 avlud  
behandlingsvätska från avslutad massakot eller bleksteg  
en spent liquor, waste liquor  
the process liquid from a completed pulp cook or bleaching stage  
fr lessive / usée, lessive f jälielmi  
épissée, lessive / résidu- no avlud  
aire  
de Ablauge f  
da sortlud
- 1037 avlötning, lutning  
avdragning av förbrukad kokvätska (avlut) från kokare efter genomförd massakokning  
en spent liquor separation  
the removal of used cooking liquor (spent liquor) from the digester at the end of a pulp cook  
fr séparation / de la lessive fi jäliemmen poisto  
usée no lutning  
de Kocherentlaugen n
- 1038 avslutningslängd, se slutlängd [3278]
- 1039 avspänningskärl, expansionskärl  
kärl vari ånga frigörs ur varm vätska  
Avspänningskärlet är ofta en cyklot. Vätskan kan exempelvis vara avlut från en kontinuerlig kokare.  
Det engelska ordet *flash tank* bör inte användas som svensk term.  
en flash tank  
vessel in which steam is released from a hot liquid  
The flash tank is often a cyclone. The liquid can e.g. be spent liquor from a continuous digester.  
fr cillerie f de détente, cuvier fi paisuntassilöö  
m de détente no expansionsbeholder  
de Entspannungsgefäß n
- en pressure control relief, top relief  
the release of gas and water vapour from a digester during the cooking of pulp in order to control the pressure  
Cf. final relief [2705].  
fi kaasutus  
no gassing  
fr échappement m  
de Abgasen n
- avhartsning  
sänkning av massas innehåll av extraktämnen (hartsäyra, fett, vax c.d.)  
Avhartsning kan exempelvis ske genom franslning av små, hartsrika partiklar eller genom kemisk behandling (förtvättning, emulgering; c.d.)  
en deresination, depitching / US/  
the reduction of the contents of extractive substances (resin acid, fat, wax etc.) in pulp  
Deresination can be accomplished, for example, by screening off small, resin-rich particles or by chemical treatment (saponification, emulsification etc.).  
fr dérésinage m  
de Entharzen n  
da rensning for harpiks
- avluftning, mäldavluftning  
avlägsnande av luft ur mäld, vanligen i kärl som slår under vakuum  
en deaeration  
the removal of air from the stock, normally in a vessel which is under vacuum  
fi ilmanpoisto (sulpuista)  
no avluftning  
fr désaération f  
de Entlüftung f  
da afluftning